



UPDATE OF INDICATORS OF THE STATUS OF THE NORTHERN GULF OF ST. LAWRENCE (3PN, 4RS) COD STOCK IN 2013

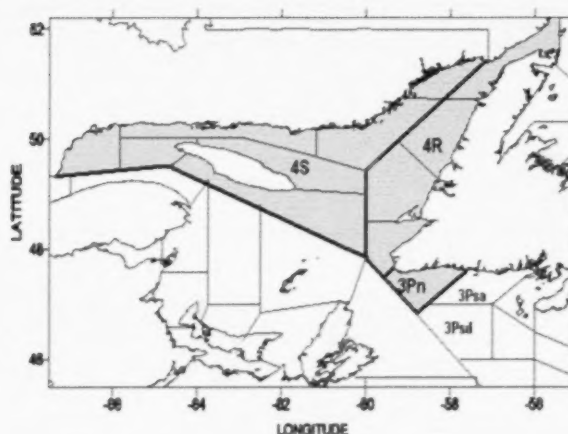


Figure 1. Cod stock management area in the northern Gulf of St. Lawrence. For reference, fishing areas 3PSa and 3PSd are indicated.

Context

The 2011 assessment of cod (*Gadus morhua*) in the northern Gulf of St. Lawrence (3PN, 4RS) (Figure 1) indicated that the stock was still in the critical zone (DFO 2012). This assessment concluded that catches should be as small as possible to allow for stock rebuilding. The update of indicators of the status of this stock in 2012 (DFO 2013) indicated that this conclusion remained valid for the 2013 fishing season. A total of 1 500 t of this stock was landed in the commercial and recreational fisheries in 2013.

The purpose of this update is to determine whether there were major changes in the status of this stock since the last assessment (2012). This document summarizes the findings of a Science Special Response Process that took place December 6, 2013 at the Maurice Lamontagne Institute, in Mont-Joli. Information from landings, research surveys conducted by DFO vessels, and sentinel fisheries fixed and mobile gear surveys were reviewed for this update. The next assessment of this stock is scheduled for winter 2015.

Analysis

Landings

Cod landings in the northern Gulf of St. Lawrence exceeded 100 000 tonnes from 1982 to 1984 (Figure 2). The fishery was under a moratorium from 1994 to 1996 and in 2003. Landings and total allowable catches (TACs) varied between 1 500 and 7 500 t after 1996. Preliminary landings reported for 2013 total 1 250 t for a TAC of 1 500 t. These landings do not include recreational fishery catches because they are not known.

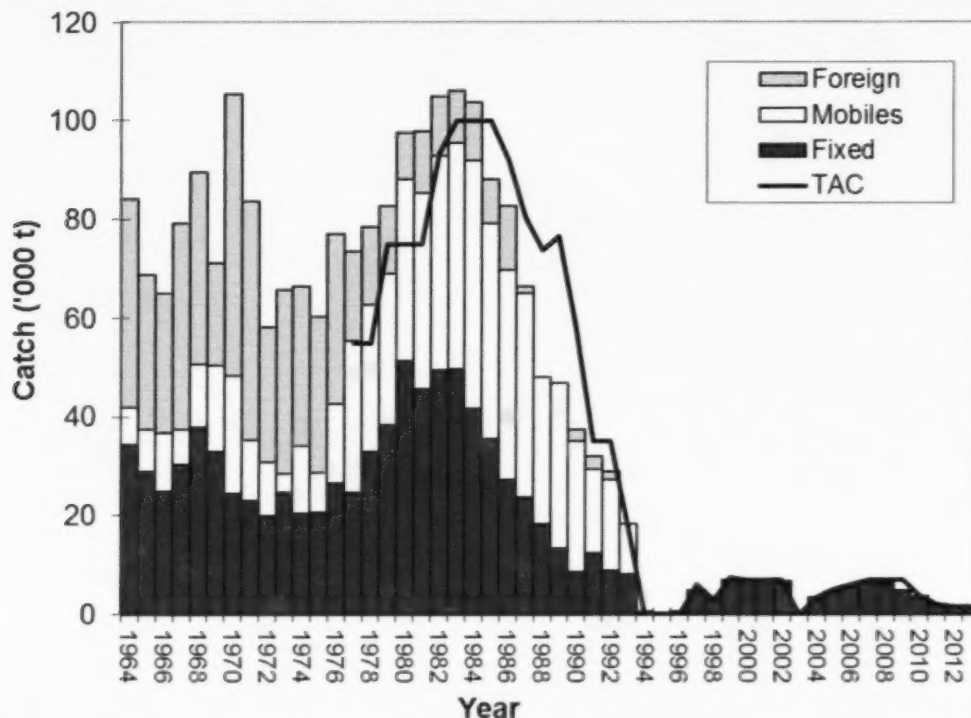


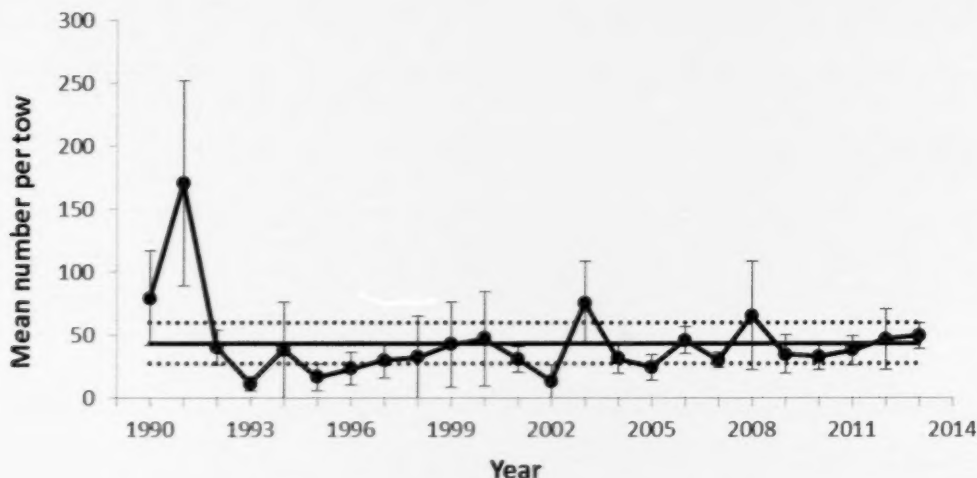
Figure 2. Landings and total allowable catches (TACs) by management year.

Stock Status Indicators

DFO Bottom Trawl Research Survey (4RS)

The mean number and mean weight per tow for cod have been generally low and stable since 1992 (Figure 3). The 2013 index values are equal to the 1990 to 2012 series average (Archambault et al. 2013).

A)



B)

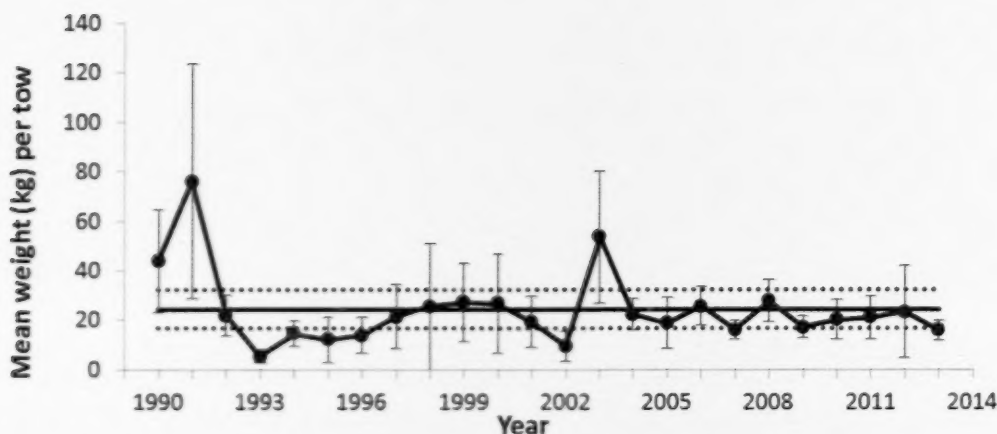


Figure 3. Mean number (A) and mean weight (B) per 15-minute tow during the DFO research survey (4RS). The error bars indicate 95% confidence intervals. The solid line represents the 1990–2012 series average and the dotted lines $\pm \frac{1}{2}$ standard deviation around the average.

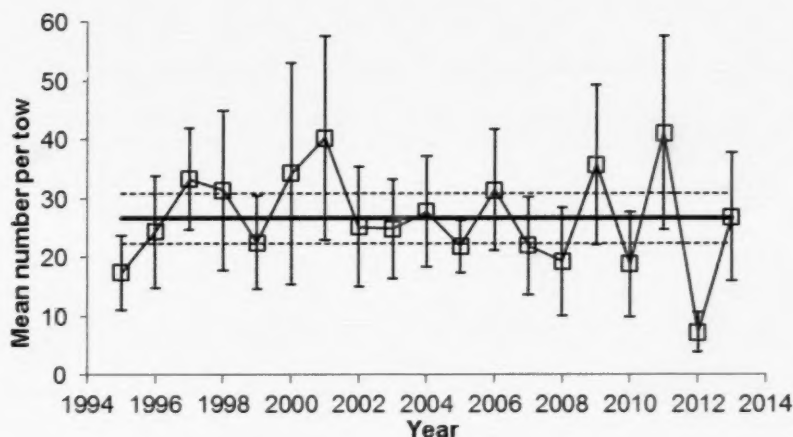
Sentinel Fisheries Program – Mobile Gear Survey (3Pn, 4RS)

This survey is conducted in collaboration with fishers and following a depth-stratified random sampling protocol similar to that used in the DFO scientific survey. Two series are studied: one for the 1995 to 2013 period based on sampling strata 20 fathoms and deeper, and one for the 2003 to 2012 period including all strata, i.e. 10 fathoms and more (Fr chet et al. 2009, Sentinel Fisheries Program).

Indices of 20 fathoms and more (1995–2013)

The indices for this series in the July Sentinel Fisheries Program Mobile Gear Survey fluctuated without presenting a clear trend (Figure 4), especially in recent years. In 2013, the values were near the average in both series.

A)



B)

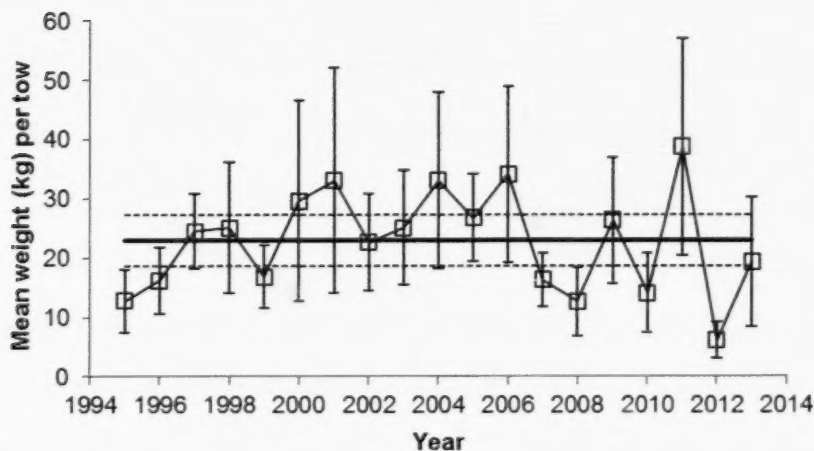
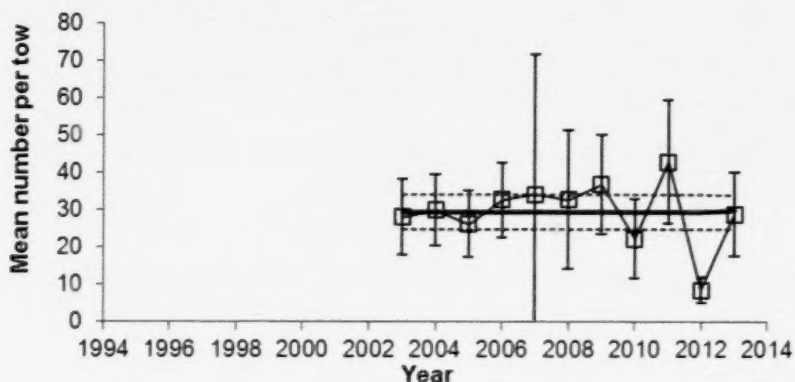


Figure 4. Mean number (A) and mean weight (B) (\pm 95% confidence interval) per 30-minute tow observed during the Sentinel Fisheries Program Mobile Gear Survey (20 fathoms and more). The solid line represents the 1995–2012 series average and the dotted lines \pm $\frac{1}{2}$ standard deviation around the average.

Indices of 10 fathoms and more (2003–2012)

The indices from the Sentinel Fisheries Mobile Gear Survey for the series, including strata of 10–20 fathoms, showed few trends in stock abundance and biomass from 2003 to 2012. In 2013, the mean number per tow index was similar to the average whereas the mean weight per tow was below the series average (Figure 5).

A)



B)

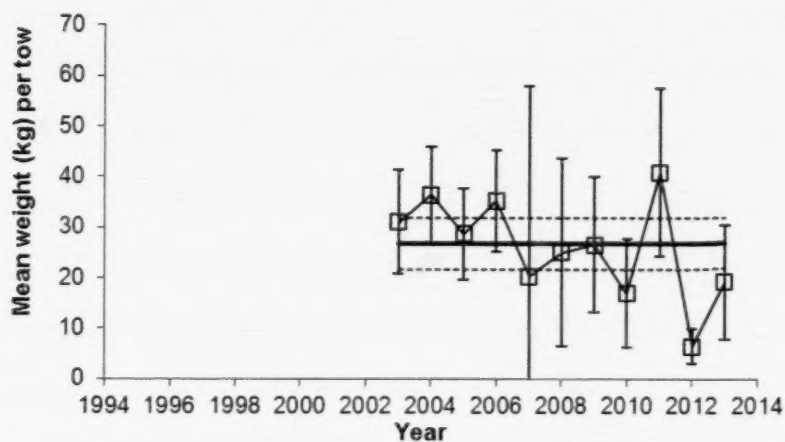


Figure 5. Mean number (A) and mean weight (B) (\pm 95% confidence interval) per 30-minute tow observed during the Sentinel Fisheries Program Mobile Gear Survey (10 fathoms and more). The solid line represents the 2003–2012 series average and the dotted lines \pm 1/2 standard deviation around the average.

Sentinel Fisheries Program – Fixed Gear (3Pn, 4RS)

The Sentinel Fisheries Fixed Gear Program using gill nets and longlines includes 25 sites operating from January to December (Fr chet et al. 2009, [Sentinel Fisheries Program](#)). The 2013 catches per unit effort (CPUE) data are preliminary and include fishing activities that took place from the beginning of January through mid-November.

For longline, the 2013 CPUE increased to a value above the 1993–2012 series average whereas for gillnet, the CPUE decreased but still remained above the series average (Figure 6).

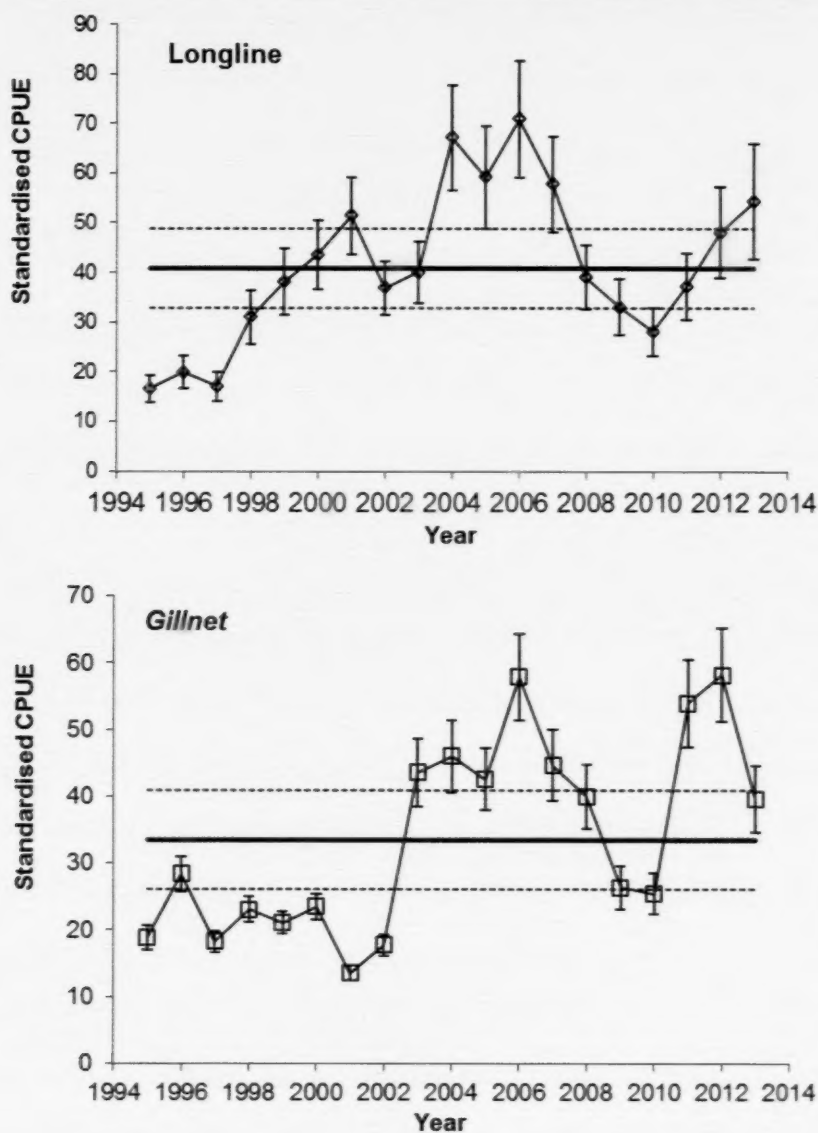


Figure 6. Standardized catch per unit effort (CPUE) ($\pm 95\%$ confidence interval) for the Sentinel Fisheries Fixed Gear Program. The solid line represents the series average for 1995–2012, and the dotted lines $\pm 1/2$ standard deviation around the average.

Conclusions

- The preliminary landings reported in 2013 were 1 250 t, for a TAC of 1 500 t. Within this TAC, a catch of 80 t is expected from the recreational fishery, but catches in this fishery are not recorded. The TAC for 2014 was set at 1 500 t in the spring of 2013.
- Overall, the values of the various stock status indicators are comparable to the average values observed in recent years. With no major changes in these indices since the last assessment, the most recent scientific advice remains valid (DFO 2012) for the next fishing season.
- The stock is still in the critical zone and well below the limit reference point (LRP) (Duplisea and Fréchet 2011). Implementing a precautionary approach is a priority for promoting stock recovery.

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Sources of information

This Science Response Report results from the December 6, 2013 Science Response Process on the update of Stock Status Indicators for Cod (3Pn4RS) and Atlantic halibut in the Gulf of St. Lawrence (4RST) in 2013. Additional publications from this meeting will be posted on the Fisheries and Oceans Canada Science Advisory Schedule as they become available.

Archambault, D., Bourdages, H., Brassard, C., Galbraith, P., Gauthier, J., Grégoire, F., Lambert, J., and Nozeres, C. 2014. Preliminary results from the groundfish and shrimp multidisciplinary survey in August 2013 in the Estuary and northern Gulf of St. Lawrence. DFO Can. Sci. Advis. Sec. Res. Doc. 2014/010. v + 97 p.

Duplisea, D. and Fréchet, A. 2011. Updated reference point estimates for northern Gulf of St. Lawrence (3Pn, 4RS) cod (*Gadus morhua*) based on revised beginning of year weights at age. DFO Can. Sci. Advis. Sec. Res. Doc. 2011/003. iv + 8 p.

Fréchet, A., Gauthier, J., Schwab, P., Lambert, Y., Le Bris, A. Tournois C., Way, M. and Collier, F. 2009. The status of cod in the Northern Gulf of St. Lawrence (3Pn, 4RS) in 2008. DFO Can. Sci. Advis. Sec. Res. Doc. 2009/090. iv + 104 p.

DFO. 2011. Recovery Potential Assessment for the Laurentian North Designatable Unit (3Pn, 4RS and 3Ps) of Atlantic Cod (*Gadus morhua*). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2011/026.

DFO. 2012. Assessment of the northern Gulf of St. Lawrence (3Pn, 4RS) cod stock in 2011. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/005.

DFO. 2013. Update of Indicators of the Status of the Northern Gulf of St. Lawrence (3Pn, 4RS) Cod Stock in 2012. DFO Can. Sci. Advis. Sec. Sci. Resp. 2012/043.

This report is available from the:

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Aussi disponible en français:

MPO. 2014. Mise à jour des indicateurs de l'état du stock de morue du nord du golfe du Saint-Laurent (3Pn, 4RS) en 2013. Secr. can. de consult. sci. du MPO. Rép. des Sci. 2014/009.